

CARBOSURF



Bio Base Europe
Pilot Plant

New processes for the fermentative production of glycolipid biosurfactants and sialylated carbohydrates

SCOPE OF THE PROJECT:

In the CARBOSURF project, existing **biosurfactants** and **specialty carbohydrates technology platforms** are taking the challenge to answer concrete needs from the market, in close cooperation with major market players in the field. Tailor-made molecules with promising market potential will be developed in a close cooperation that spans the entire innovation chain. This ensures that scientific developments follow a market-driven approach and guarantees that maximum results are coming out of the technology platforms.

The CARBOSURF project will address the **full exploitation of two very promising types of specialty biochemicals** with high market interest and a wide range of application fields, namely:

- **glycolipid biosurfactants** [rhamnolipids, sophorolipids, xylolipids and mannosylerythritol-lipids]
- **specialty carbohydrates** [sialylated oligosaccharides, a class of very complex Human Milk Oligosaccharides that find application as a nutraceutical, pharmaceutical and cosmetic ingredient].

The project targets for both product lines:

- The development of **microbial producer strains** through metabolic engineering.
- The development and optimization of the fermentation processes and downstream processing in order **to obtain an industrial process**.
- The development of **second generation technology** based on lignocellulosic substrates as fermentation feedstock.
- The **production of sufficient amounts** of the new products for application testing, in order to **evaluate their market potential** in a wide range of application fields.
- The assessment of the technical, economic, environmental and social sustainability of the process over the whole value chain from biomass to product, with an emphasis on identifying and addressing the bottlenecks in the innovation chain.
- The draft of a **valorisation plan** to complete the innovation process.

The project consortium has all the required players to obtain the expected impact: RTO's to address the research challenges in this project, an open innovation pilot plant to optimize and scale up the new processes, three biotech SMEs and three large industries to ensure the exploitation of the project results.



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APPLICATIONS:

Surface-active agents (SAs) are one of the most important classes of industrial bulk chemicals worldwide with uses in a wide variety of applications in food, beverages, personal care, cosmetics, pharmaceutical sectors and many more. Industry is looking to replacing synthetic SA ingredients, with more sustainable, natural and eco-friendly counterparts. Microbially-derived SAs offer a viable solution, they can be produced from renewable feedstock or waste streams and by natural fermentation processes. They are readily biodegradable, display low eco-toxicity, and many can exhibit multiple levels of functionality.

Sialylated oligosaccharides have applications in a very broad range of markets, going from the pharmaceutical and the cosmetic market to the lower end food and feed markets. Human milk oligosaccharides have a protective effect against necrotizing enterocolitis in early newborns with low birth weight, but also in elderly nutrition (active on many bowel and intestinal diseases), pet and animal feed. The latter market is driven by the need to reduce the antibiotic use for animals.

Coordinator:



Partners:



For more information: please visit:

www.carbosurf.eu

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or email to Brecht.Vanlerberghe@bbeu.org

ACTIVITIES of Bio Base Europe Pilot Plant:

- ▶ **Second generation substrate** development
- ▶ Development of a **scalable fermentation process** for the Glycolipid biosurfactants
- ▶ Development of a **fermentation protocol** for the production of specialty carbohydrates
- ▶ The development and optimization of the **downstream processing** for each target molecule to obtain a robust and efficient production system meeting the required specifications
- ▶ Assist in techno-economical, social-economical, IP, and LCA evaluation
- ▶ Assist in **product characterization** and **standardization**

